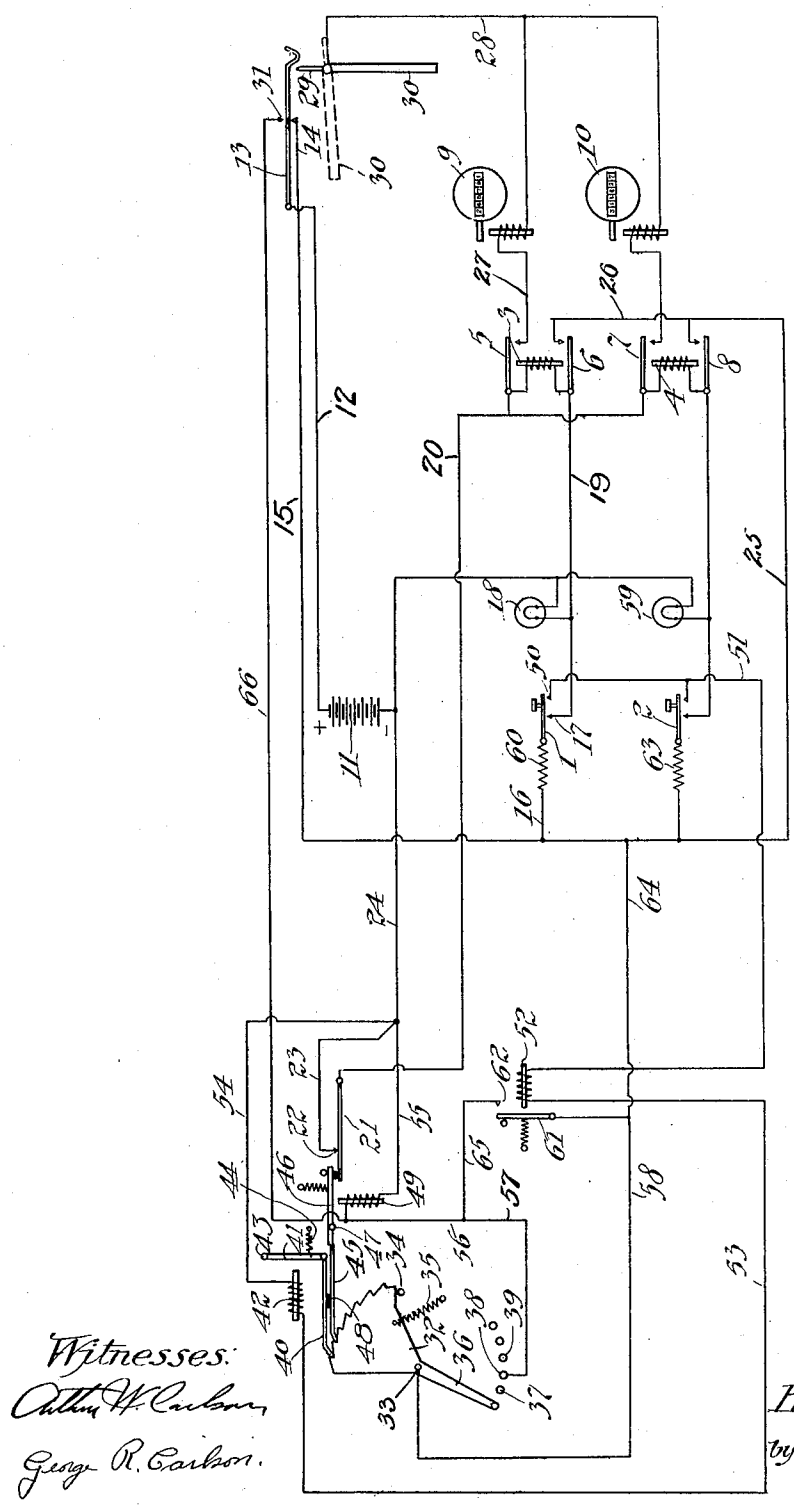
H. O. RUGH.

VOTING MACHINE.

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HARRY O. RUGH, OF CHICAGO, ILLINOIS, ASSIGNOR TO RAILWAY ELECTRIC MANUFACTURING CO., OF CHICAGO, ILLINOIS.

VOTING-MACHINE.

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To all whom it may concern:

Be it known that I, HARRY O. RUGH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Voting-Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to electrical voting machines and has for its object the provision of an improved machine of this character and improved circuit arrangements for machines of this type.

My invention contemplates the provision of means by virtue of which it is impossible to register votes for more than a predetermined number of candidates within a given class. For instance, there may be four candidates for mayor; it of course would not be proper to vote for more than one candidate at a time and my invention provides electrically controlled mechanism whereby but one candidate can be voted for at a time.

My invention is also of such a character that it can be set to permit the voting for say three candidates out of a total of more than that number. The mechanism which accomplishes this result in the preferred form of my invention is the same whereby but one candidate of a class may be voted for or more than one, and thus involves the mere duplication of complete sets of apparatus depending upon the number of classes to be voted for. Thus the complete machine is divided into what I might call sections, each section preferably accommodating under normal circumstances one given class out of which a predetermined number are to be selected.

I will describe in the accompanying drawing one such section of my improved machine and circuit arrangement, it being understood that the addition of further classes of candidates or further sections of my invention would under ordinary circumstances involve mere duplication. All the sections however could of course be operated through the agency of a single source of current as will be readily apparent from the structure.

In the drawing I show diagrammatically one form of my improved machine with the circuit arrangements therefor.

In the drawing herein I illustrate one section of my improved system, it being contemplated herein that out of two available candidates but one may be voted for at a time, it being assumed possibly that the two candidates might represent the Democratic and the Republican candidates for mayor. This particular section of my improved system as herein disclosed has two keys 1 and 2 respectively which may be chosen for operation by the voter. Whenever key 1 is depressed it operates relay 3, and whenever button 2 is depressed it operates the relay 4. The relays 3 and 4 respectively have armatures 5, 6, and 7, 8. A coil controlled totaling mechanism or counter 9 is provided for the relay 3 and a similar device 10 is provided for the relay 4. Thus whenever an impulse is transmitted through the coil of either device 9 or 10, the counter carried therewith is moved one space. A central source of current 11 is provided whose association in the various subcircuits will appear throughout this description. Whenever button 1 is operated, for instance, a circuit is established from battery 11, through conductor 12, spring 13, contact spring 14, conductor 15, conductor 16, lever 1, contact post 17, through indicating lamp 18 to the battery 11, thus causing ignition of the lamp corresponding to the button depressed to apprise the votor of his selection. At the same time a parallel circuit extends from the contact post 17 by way of conductor 19 through relay 3, conductor 20, contact spring 21, contact post 22, conductor 23, and conductor 24 to the battery 11. The relay 3 being energized attracts its armatures 5 and 6. The attraction of the armature 6 establishes a circuit which can be traced from the battery 11, through conductor 12, springs 14, 13, conductor 15, conductor 25, conductor 26, armature 6, relay 3, conductor 20, springs 21 and 22, conductor 23, and conductor 24 to the other terminal of the battery 11. It will thus be seen that the relay 3 is locked in position even though the key or button 1 is released from its actuated position. The attraction of the armature 5 connects one terminal of the coil of the counter 9 with a negative terminal of the battery 11, this

circuit being traced from the said negative terminal of said battery by way of conductors 24 and 23, contacts 22 and 21, conductor 20, armature 5, and conductor 27 to one terminal of the coil 9. The other terminal of this coil, and in fact all other coils, is connected by means of the common conductor 28 with a contact element 29. This contact element 29 is carried by a swinging gate or similar device 30, which is operated when the voter leaves the booth from its dotted position to its full position, thereby connecting the contact element 29 with the spring 13 and completing the circuit from the coil 9 by way of conductor 28, contact element 29, spring 13, conductor 12, to the positive terminal of the battery 11. It will thus be seen that the voter operates the button for the particular candidate, whereupon the selected relay locks itself in position, and at the same time places its corresponding coil controlled counter in position to count one vote for the selected candidate when the voter leaves the booth. The movement of the gate 30 from one position to the other likewise serves to break the contact between the springs 13 and 14 and establish contact between the spring 13 and the contact spring 31. Breaking of the contact between springs 13 and 14 opens the path for the current flowing through the locked relay (relay 3 or relay 4) and thus causes the restoration of the selected relay to its unoperated position, normally the position shown in the illustration.

It is of course essential that of the two candidates presented for selection that the voting for one only be permitted each individual voter. To that end my invention provides mechanism which makes it impossible to place more than one counting element 9 or 10 in condition for operation at any given time and to accomplish this result I provide a step-by-step element 32 preferably in the form of a part of a ratchet wheel which is pivoted at 33 and is normally retained against its limit stop 34 by a spring 35. This step-by-step element carries an arm 36 fixed to itself which is adapted to slide over various contact segments 37, 38, 39, etc. A step up pawl 40 is provided which is normally in engagement with the teeth of the ratchet and this step up pawl is carried by an armature 41 of a coil 42. This armature 41 is pivoted at 43 and withdrawn by a retractile spring 44. Now whenever the coil 42 is energized it attracts its armature 41 and moves the step-by-step element 32 the distance of one notch where it is held by the holding pawl 45. This holding pawl is carried by an armature 46 pivoted at 47. This holding pawl is normally in engagement with the teeth of the ratchet wheel 32. An insulating button 48 is carried by the holding pawl to prevent the holding pawl and step up pawl from coming into engagement, but this button 48 permits the step up pawl to slide freely thereon. The armature 46 when attracted also opens the circuit between springs 21 and 22 as is readily apparent from the illustration. The armature 46 is controlled by the coil 49. Now whenever the coil 49 is energized it attracts its armature 46, thereby raising the holding pawl 45 and therewith also the step up pawl 40 out of engagement from the ratchet wheel 32, thus permitting this ratchet wheel to be restored to normal against its stop 34. This step-by-step mechanism, as stated, prevents the active selection of more than one counter at a time.

Assuming, for instance, that button 1 has been operated, relay 3 been energized and the coil of counter 9 placed in a receptive condition, then this operation of the key 1 at the same time has established a circuit which extends from the lever 1 through the contact post 50, conductor 51, coil 52, conductor 53, coil 42, conductor 54, conductor 24, battery 11, conductor 12, springs 13 and 14, conductor 15, conductor 16, to the lever 1. Thus the energization of the relay 42 has moved the step-by-step wheel one notch so that the arm 36 engages the contact 37.

Now should the same voter without leaving the booth subsequently depress button 2, then a second impulse would pass through the coil 42, thereby moving the step-by-step element 32 another notch, thus bringing the arm 36 into circuit connection with the contact 38. Under these conditions a circuit is established from the negative terminal of battery 11 by way of conductor 24, conductor 55, coil 49, conductor 56, conductor 57, contact 38, arm 36, conductor 58, conductor 15, switches 13 and 14, conductor 12, to the positive terminal of the battery 11. It will be seen that under these conditions an impulse passes through the coil 49, thereby attracting its armature 46 to restore the element 32 to its starting position and at the same time break the circuit between the springs 21 and 22. Immediately the circuit between the springs 21 and 22 is broken the circuit through either selected relay 3 or 4 (whose locking circuit extends by way of conductor 20) is broken and any selected relay is restored to normal. Thus a faulty manipulation on the part of the voter restores all parts to their initial position, at the same time, of course, extinguishing any illuminated lamp 18 or 59 and apprising the voter that no counting mechanism is in a receptive condition.

It will of course be understood that if it be desired, for instance, to select two candidates (possibly aldermen) out of a total number greater than two, then the conductor 57 would be connected with any appropriate contact associated with the arm 36

so that the restoration does not take place until after the designated number have been voted for. It will be seen also that in this manner additional sections similar to the one herein illustrated can be added to accommodate other groups of candidates. I provide certain mechanism consisting of the relay 52 and associated parts by which a further faulty actuation is prevented. If this relay 52 and its parts were not installed, it might be possible for instance to press button 1 and hold it depressed while pressing succeeding buttons such as button 2. By holding the button 1 depressed, of course, only one impulse passes through the coil 42 and the step-by-step element would move only one notch no matter how many keys in the same section were subsequently depressed. This would defeat the purpose of the machine and to avoid such a contingency the relay 52 and its associated parts are provided. This relay 52 is so arranged that when one key 1 is depressed, a certain amount of current passes through this relay 52 governed by the resistance 60. This amount of current is not sufficient to actuate the relay 52. Now should a second key 2 be depressed however, then additional current traverses the relay 52 sufficient to operate it and thereby attract its armature 61, the operation of the key 2 including the resistance 63. The attraction of the armature 61 establishes a circuit from the terminal of the battery 11 through conductor 12, springs 13, 14, conductor 15, conductor 64, armature 61, contact 62, conductor 65, conductor 56, coil 49, conductor 55, conductor 24, to the battery 11. Thereupon coil 49 is energized which again permits a restoration of the element 32 to normal, and by the disruption of the contact between the elements 21 and 22 causes restoration of the relays 3 or 4 to their unoperated position. It will also be noted that as the arm 30 moves the spring 13 it closes contact with the contact point 31, thus establishing a circuit which can be traced from the positive terminal of the battery 11, through conductor 12, spring 13, spring 31, conductor 66, magnet 49, conductor 55, conductor 24, to the negative terminal of the battery 11, thus also restoring the step-by-step mechanism to normal.

From what has been described, the nature of my invention will be clear and it will also be understood that many modifications may be made without departing from its spirit. It must be understood, of course, that what is here illustrated represents but one class of candidates and that the complete voting machine would require the duplication of the apparatus here illustrated to make it complete.

Having however thus described one form which my invention may take, what I claim as new and desire to secure by Letters Patent is:

1. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, and step-by-step means operable by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means.

2. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, and means operable independently of said electromagnetic switching means by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means.

3. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, means operable independently of said electromagnetic switching means by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means, and an indicator for each individual switch element initially controlled by its associated switch element, and subsequently controlled by its associated electromagnetic means.

4. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, means operable independently of said electromagnetic switching means by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means, and an indicator for each individual switch element initially controlled by its associated switch element, and subsequently controlled by its associated electro-magnetic means, said electromagnetic switching means being arranged to set the circuit to their corresponding register for subsequent closure.

5. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said

switch elements and its associated register, means operable independently of said electromagnetic switching means by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means, an indicator for each individual switch element initially controlled by its associated switch element, and subsequently controlled by its associated electro-magnetic means, said electromagnetic switching means being arranged to set the circuit to their corresponding register for subsequent closure, and a common register actuating switch adapted to control the closure of the circuits through the selected register.

6. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, and step-by-step means operable independently of said electromagnetic switching means by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means.

7. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, step-by-step means operable independently of said electromagnetic switching means by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means, and an indicator for each individual switch element initially controlled by its associated switch element, and subsequently controlled by its associated electro-magnetic means.

8. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, step-by-step means operable independently of said electromagnetic switching means by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means, and an indicator for each individual switch element initially controlled by its associated switch element, and subsequently controlled by its associated electro-magnetic means, said electromagnetic switching means being arranged to set the circuit to their corresponding register for subsequent closure.

9. A voting system of the character described having a plurality of actuable individual switching devices, a register for each switching device, electromagnetic switching means interposed between each of said switching devices and its associated register, and selectively responsive means operable by the simultaneous actuation of more than a predetermined number of switching devices to control the restoration to normal of all selected electromagnetic switching means.

10. A voting system of the character described having a plurality of actuable individual switching devices, a register for each switching device, electromagnetic switching means interposed between each of said switching devices and its associated register, and means operable independently of said electromagnetic switching means by the simultaneous actuation of more than a predetermined number of switching devices to control the restoration to normal of all selected electromagnetic switching means.

11. A voting system of the character described having a plurality of actuable individual switching devices, a register for each switching device, electromagnetic switching means interposed between each of said switching devices and its associated register, selectively responsive means operable by the simultaneous actuation of more than a predetermined number of switching devices to control the restoration to normal of all selected electromagnetic switching means, and an indicator for each individual switch element initially controlled by its associated switching device, and subsequently controlled by its associated electromagnetic means.

12. A voting system of the character described having a plurality of actuable individual switching devices, a register for each switching device, electromagnetic switching means interposed between each of said switching devices and its associated register, selectively responsive means operable by the simultaneous actuation of more than a predetermined number of switching devices to control the restoration to normal of all selected electromagnetic switching means, and an indicator for each individual switch element, each electromagnetic switching means controlling a circuit through its associated indicator.

13. A voting system of the character described having a plurality of actuable individual switching devices, a register for each switching device, electromagnetic switching means interposed between each of said switching devices and its associated register, selectively responsive means operable by the simultaneous actuation of more than a predetermined number of switching devices to control the restoration to normal of all se-

lected electromagnetic switching means, and an indicator for each individual switch element initially controlled by its associated switching device, and subsequently controlled by its associated electromagnetic means, said electromagnetic switching means being arranged to set the circuit to their corresponding register for subsequent closure.

14. A voting system of the character described having a plurality of actuable individual switching devices, a register for each switching device, electromagnetic switching means interposed between each of said switching devices and its associated register, selectively responsive means operable by the simultaneous actuation of more than a predetermined number of switching devices to control the restoration to normal of all selected electromagnetic switching means, an indicator for each individual switch element initially controlled by its associated switching device, and subsequently controlled by its associated electromagnetic means, said electromagnetic switching means being arranged to set the circuit to their corresponding register for subsequent closure, and a common register actuating switch adapted to control the closure of the circuits through the selected register.

15. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, and means operable by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means and likewise prevent the actuation of its associated electromagnetic switching means, said electromagnetic switching means including a holding circuit.

16. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, and means operable independently of said electromagnetic switching means by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means, said electromagnetic switching means including a holding circuit.

17. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, means operable by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means, and selectively responsive means operable by the simultaneous actuation of more than a given number of switch elements to control the restoration of all selected electromagnetic switching means.

18. A voting system of the character described having a plurality of actuable individual switch elements, a register for each switch element, electromagnetic switching means interposed between each of said switch elements and its associated register, step-by-step means operable by the actuation of an individual switch element in excess of a predetermined number to control the restoration of all previously selected electromagnetic switching means, and means operable by the simultaneous actuation of more than a given number of switch elements to control the restoration of all selected electromagnetic switching means.

In witness whereof, I hereunto subscribe my name this 16th day of March, A. D., 1914.

HARRY O. RUGH.

Witnesses:
A. LYDA JONES,
HAZEL ANN JONES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."